PadhAI: MP Neuron & Perceptron

One Fourth Labs

Perceptron Learning Algorithm

What does the perceptron learning algorithm look like?

1. Perceptron model: $\hat{y} = \sum^{n}_{i=1} w_i x_i >= b$
   a. Can be rewritten as $w_1 x_1 + w_2 x_2 - b >= 0$
   b. Let $w_0 = b$ and $x_0 = 1$
   c. Further rewritten as $w_1 x_1 + w_2 x_2 - w_0 x_0 >= 0$
   d. $\hat{y} = \sum^{n}_{i=0} w_i x_i >= 0$
   e. Can be written as $w^T x >= 0$
   f. Where $w^T x = w.x$
2. Perceptron Learning Algorithm
   a. P ⇒ Inputs with label 1
   b. N ⇒ Inputs with label 0
   c. Initialize $w(w_0 ... w_n)$ randomly
   d. While !convergence do:
      i. Pick random $x \in P \cup N$
      ii. If $x \in P$ and $\sum^{n}_{i=0} w_i x_i < 0$ then, $w = w + x$; **end**
      iii. If $x \in N$ and $\sum^{n}_{i=0} w_i x_i >= 0$ then, $w = w - x$; **end**
   e. **end**
   f. The algorithm converges when all the inputs are classified correctly